

## PART III.

## PHYSICAL DESCRIPTION

Physical Regions of Washington

On the basis of surface features, Washington may be divided into eight general regions. Agricultural settlement is influenced by factors of topography, climate, soil, forest vegetation and water resources distinctive to each of the physiographic regions. Each has become a different type of farming area as settlers have learned to adapt crops and livestock to the conditions, or have improved limitations through drainage or irrigation.

## Coastal Plains

A narrow, sandy plain with shallow bays, tidal flats, stream deltas and low headlands lies between the coastline and the Coast Range. It extends from the Columbia River mouth almost to Cape Flattery, being widest and lowest in the Grays Harbor and Willapa Bay districts. The climate is mild and damp with a long growing season, but it is too cool, cloudy and wet for most crops. Originally, this area was covered with heavy forests but much of it is now covered with woodlands. Lumbering and manufacture of wood products is the main industry. Farming is largely livestock and dairying using the low uplands and drained areas in the lower Chehalis River Valley. Cranberry growing is important and well-adapted to numerous, boggy areas in the Grays Harbor and Willapa Bay sections. The shallow bays are also used for oyster culture. Fishing is common in the rivers and coastal banks.

## Coast Range

The Coast Range is an uplifted area of sedimentary and metamorphic rocks divided into the Olympic Mountains and the Willapa Hills. The Olympics tower to nearly 8,000 feet in a dome-like structure, carved deeply by rivers. These mountains have the heaviest precipitation in the state. Snowfields and heavy forest cover the mountains. Most of the wilderness area is within the Olympic National Forest and Olympic National Park, being managed for recreation, wildlife and timber. Farm settlement is limited to some foothill river plains and coastal terraces such as the Dungeness and Port Angeles districts along the Strait of Juan de Fuca. Here in the lee of the mountains, rainfall is moderate and irrigation is practiced by some livestock farmers. The Willapa Hills country is wet, heavily forested and carved into numerous narrow valleys. Logging is the main industry, combined with livestock farming in the upper Chehalis River Valley and along the banks of the Columbia River. Wet climate, hilly topography and the difficulty of clearing stump land retards agriculture.

## Willamette-Puget Sound Lowland

A broad lowland, described as a trough or valley, lies between the Coast Range and the Cascade Mountains. The northern part is the Puget Sound Lowland which has been glaciated and is occupied by the sea in the lowest section. The continental glacier reached slightly south of Olympia. Under a warming climate it melted and geologists believe it receded about 25,000 years ago, leaving an infertile plain of moraines and outwash gravels, sands and clays known today as the Puget Glacial Drift Plain. Its rolling surface has numerous lakes and bogs.

Most of the major cities--Seattle, Tacoma, Everett, Bellingham and Olympia--have been built on moraines bordering the Sound. Rivers, such as the Nooksack, Skagit, Snoqualmie, White and Puyallup have built up deltas and flood-plains over the older gravelly plains. These narrow valleys are more fertile than the older glacial plains and support numerous small dairy, vegetable and berry farms. Most of the gravelly areas are wooded with a second-growth forest and are used for pastures. In the southern part of the Willamette-Puget Sound Lowland, there are two large valleys--the Cowlitz and Chehalis. They drain a low, hilly area with several flat prairies and bottomlands.

Agriculture is handicapped by poor drainage and flooding of the river deltas and plains, by heavy winter rainfall, by cloudy but dry summers, by coarse, gravelly upland soils and by densely wooded land which is costly to clear. Advantages are mild climate and a location close to major markets for farm products such as milk, poultry and vegetables.

#### Cascade Mountains

The Cascades are a wide and high topographic and climatic barrier which separates western and eastern Washington. The range is made up of sedimentary, igneous and metamorphic rocks which have been carved by glaciers and streams. High, isolated volcanic cones of lava such as Mt. Adams (12,397 feet), Mt. Rainier (14,408 feet) and Mt. Baker (10,791 feet) appear upon the older Cascade rocks. The Cascade crest varies between 3,000 and 10,000 feet and is higher and more rugged in northern Washington. Roads and railroads have been built across its lower passes in central and southern Washington. The Columbia River has cut a deep gorge and the lowest pass through the barrier. The western slope is wet and heavily forested with Douglas fir. The eastern slope is drier with a less-dense pine forest. Nearly all classified as forest land, most of the area is in Federal ownership in five national forests and Mount Rainier National Park. Tree fruit farming in the eastern slope valleys of Wenatchee, Chelan, Methow, Naches and the Columbia Gorge is most important. Sheep and cattle summer grazing on alpine grasslands is another use. Deep western slope valley bottoms such as the Skagit, Snoqualmie, Nisqually, Cowlitz and Lewis also contain livestock farms. The area is vitally important as a watershed for irrigation and city drinking water and a source of timber. Steep terrain, wet climate, short growing seasons and heavy forest vegetation are main handicaps for agriculture.

#### Columbia Basin

A low plateau of old lava rocks covered with stream and wind-deposited soils extends in a series of plains, ridges, coulees and hills from the Cascades to the eastern Washington border. The area is basin-like in structure, being higher around its margins and sloping inward to low and level central plains. It has been sharply eroded by the Columbia River and its interior tributaries, the Snake, Yakima, Palouse and Spokane Rivers. The basin has sub-areas created by crustal movements and erosion.

- A. The Yakima Folds are a series of hilly ridges extending from the Cascades eastward into the lower part of the basin. The Yakima and Columbia Rivers have cut gaps through the ridges and have built up plains in the troughs between them. The rich alluvial plain of the Yakima River is an important irrigated valley.

- B. The Waterville Plateau is a tableland of thin soils overlying basaltic rock at an elevation of 2,500 to 3,000 feet. It has gorges cut by the Columbia River and ancient glacial outwash streams once flowing in Moses and Grand Coulees. It is too high for irrigation and is used for dryland grain and livestock farming.
- C. The Channelled Scablands is a belt of dry terrain carved by ice-age rivers into a series of coulees. Bare rock is exposed in the coulees. Small plateaus between the old river channels have thin soils used for dryland farming. The Grand Coulee of this region has been developed into a major irrigation reservoir.
- D. The Palouse Hills consist of fertile deposits of wind-blown soil overlying basaltic lava flows. After being deposited in large dunes, the formation was reshaped by streams into an intricate pattern of low, rounded hills. The hills receive 16 to 25 inches of rainfall annually and have deep, porous and fertile soils. It is one of the richest farming areas of the Pacific Northwest.
- E. The Central Plains are low and relatively level expanses of soil, deposited by old streams crossing the Channelled Scablands and later by the flooding of the Yakima, Columbia, Snake and Walla Walla Rivers. Climate is desert-like (6-12 inches of precipitation per year). The lower lands of the area, the Quincy and Pasco Basins and the Walla Walla Valley, are irrigated. The Quincy Basin is a new irrigation area watered by Grand Coulee Dam.

Agricultural handicaps in Columbia Basin regions are mainly found in its dry, continental climate. Large irrigation systems built since 1900 have overcome much of the need for water on rich valley and basin soils. Dryland farming in higher areas is practiced widely, although occasional variations in rainfall, lack of snowfall, winter-kill, water and wind erosion inflict damage to field crops and to livestock ranges.

#### Okanogan Highlands

A portion of the Rocky Mountains, consisting of well-eroded, old granites, lavas and sedimentary rocks, extends across north-central Washington. These are the Okanogan Highlands, the state's richest mineral area. Summit levels reach 4,000 to 5,000 feet with peaks exceeding 7,000 feet. Prominent north-south valleys are occupied by irrigated tree fruit and livestock farms. These are the Okanogan, Sanpoil, Kettle and Colville Valleys. The Columbia River gorge through the Okanogan Highlands is occupied by the large man-made lake behind Grand Coulee Dam--Roosevelt Lake. Higher and wetter portions are forested with pine and larch, and are managed for timber and for livestock ranges by the United States Forest Service and the Bureau of Indian Affairs. Cold winter temperatures, short growing seasons, dry valley climates and remoteness from markets are farming handicaps.

#### Selkirk Mountains

The Selkirks, a range of the Rocky Mountain system, extend into the northeast corner of Washington. The rocks are old mineralized granites and metamorphics reaching elevations of over 7,000 feet. The Pend Oreille River Valley at the base of the Selkirks is an agricultural area of narrow bottom lands settled by livestock farmers. Nearly all of the uplands are in Kaniksu National Forest. While

climate is cool and growing seasons are short, the Pend Oreille Valley has an advantage of being relatively in close proximity to the Spokane metropolitan market area.

### Blue Mountains

The Blue Mountains are an uplifted and eroded plateau extending into the southeastern corner of Washington. The strata are mainly ancient crystalline rocks which contain some minerals. The highest point of the mountains in the Washington section is Diamond Peak (6,401 feet), located on the divide between the Grande Ronde, Tucannon and Touchet Rivers. These rivers, and the Walla Walla River, have cut valleys into the plateau. Extensive pine forest and grassland areas are in the highlands within Umatilla National Forest, where rainfall is 30 to 40 inches. The Snake River has cut a deep valley and gorge across the lower parts of the mountains. The area is well developed agriculturally around its northern foothills where wind-blown soils are deep and irrigation systems are used. The Walla Walla and Tucannon Valleys are rich grain, legume and livestock areas of irrigation and dry farming. Grazing is an important use of the high lands by livestock ranchers in the upper valleys.

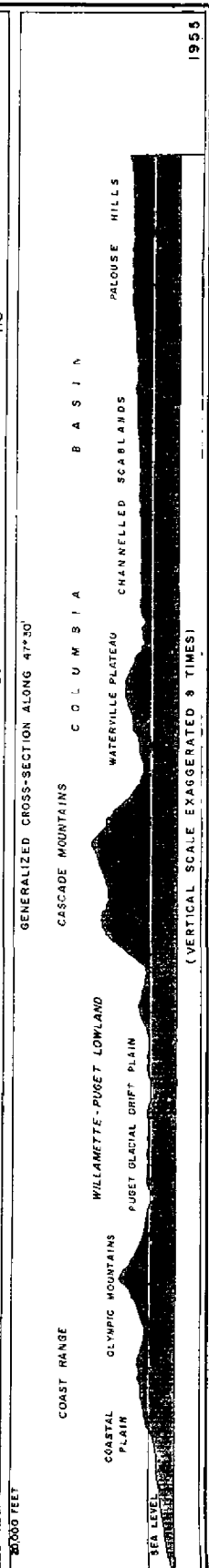
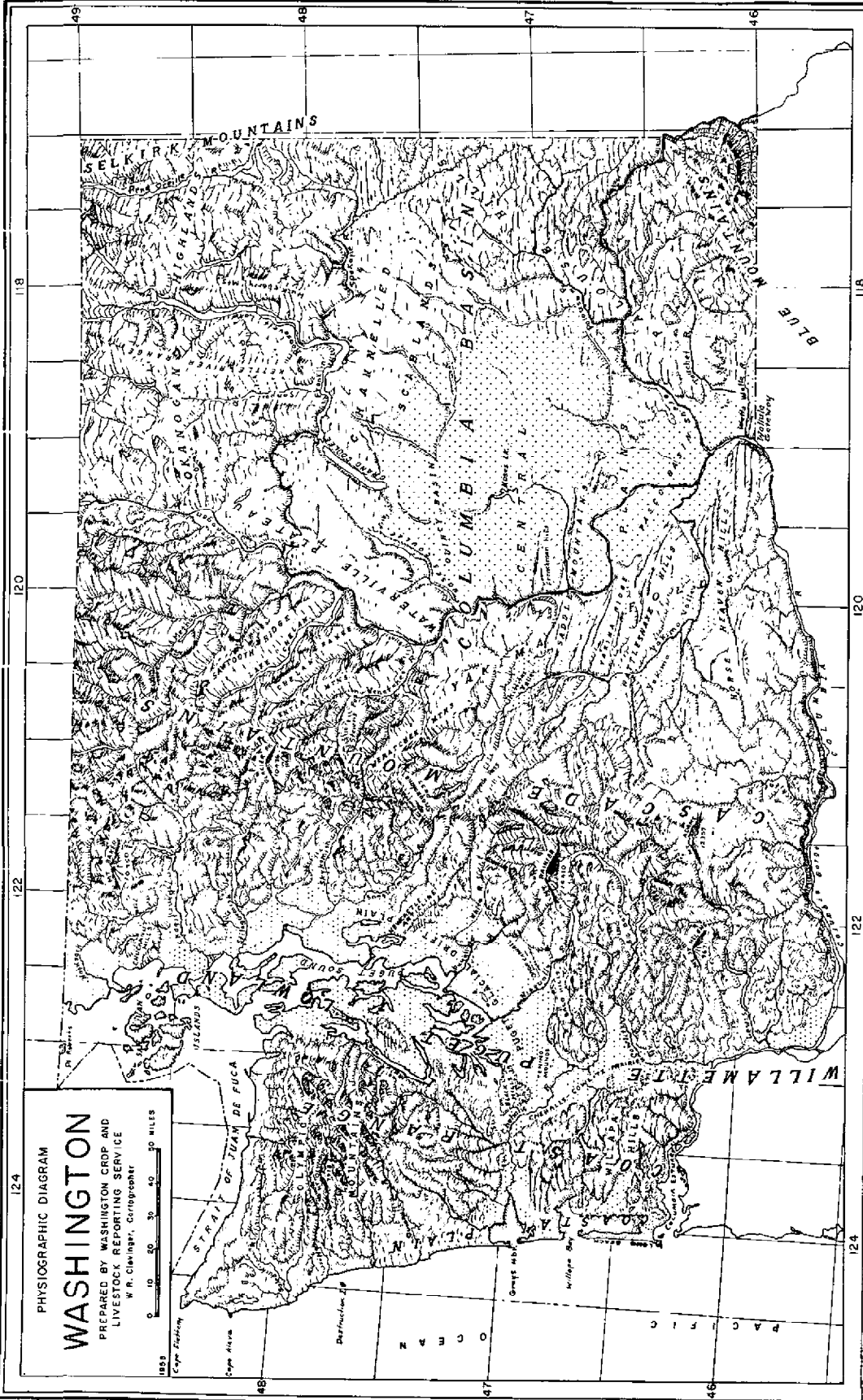
### Topography of Lewis County

The land surface of Lewis County varies from the low bottomlands and alluvial plains of the Chehalis and Cowlitz Rivers to the alpine peaks of the Goat Rocks on the crest of the Cascades. The low lands along the Cowlitz in the vicinity of Toledo are only about 80 feet above sea level. Goat Rocks are 7,500 to 8,000 feet above sea level, the highest in the county.

Three major physiographic features characterize the general topography of Lewis County. The first and most important agricultural part of Lewis County is the section containing the Willamette-Puget Lowland which extends north and south through western Oregon and Washington. It is a major valley or trough lying between the Cascade and Coast Ranges. In Lewis County, it consists of the Chehalis-Cowlitz Prairies, a chain of rolling prairies and river bottoms of the Chehalis and Cowlitz Rivers. This lowland is underlain with beds of gravel, sand and clay--materials eroded from the Coast and Cascade Ranges and deposited in past geological time.

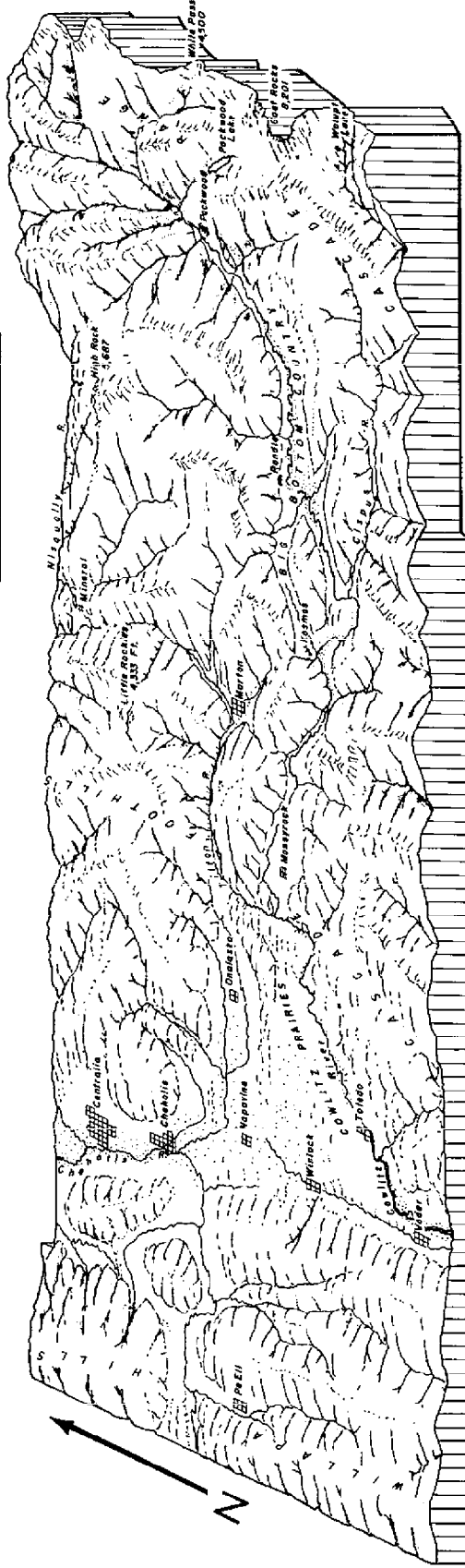
The second and third features, the Coast Range and Cascade Range physiographic provinces, cover nearly three-fourths of the county's area. The Coast Range section is well-eroded into numerous narrow valleys by the upper Chehalis River system. It appears as rough, heavily-wooded hill country from the air. They are called locally, the Willapa Hills, their highest point in Lewis County being 3,111 feet.

The eastern two-thirds of the county is in the Cascade Mountain province. Through millions of years of erosion by glaciers and streams of the Cowlitz and Nisqually River systems, this mountainous section has been reduced to numerous creek valleys. The creek bottoms and their benchlands are about 600 to 1,500 feet in elevation and are partially taken up by small farms. The low intervening ridges of 1,500 to 2,000 feet were also homesteaded for timber and some farms are located on the ridge terrain. A major valley lowland of the Cowlitz is "Big Bottom". The valley floor of the upper Cowlitz River reaches far eastward into the Cascades. Bottom lands are made up of thick deposits of stream-deposited



# TOPOGRAPHIC DIAGRAM LEWIS COUNTY

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gravel, sand, silt and clay, and range from 800 to about 1,100 feet in elevation. The deeper rocks of the Cascade section are mainly coal-bearing sedimentary rocks which are tilted, folded and faulted in a complex manner. An upper layer of rock is made of old lavas (basalt) and some new lavas extruded by volcanic eruptions in the Mt. Rainier and Mt. Adams areas. Much of the area has a mantle of pumice stone or volcanic ash deposited in recent geological time from the cones of Mounts Rainier, Adams and St. Helens.

Most of the county's farms are located on the Chehalis-Cowlitz Prairies between Toledo and Centralia. Alluvial plains called Cowlitz, Newaukum, Klickitat, Drews, Ford, North, Jackson and Boistfort Prairies are the oldest and most developed farmlands. Chehalis River bottoms in the Willapa Hills also have numerous farms. The bottom lands of the upper Cowlitz River extend like a ribbon far back into the mountains. The county has a large amount of steeply-sloped foothill land included in farms. Homesteaders who chose lands in narrow valleys were obliged to take much valley-side and hilly land as part of their claims of square quarter-sections of 160 acres. The steep portions of the homesteads have been cleared for pastures in many places.

#### Forests and Wildlife

Through fire, clearing and logging, man has greatly modified the natural vegetation. This change started with the burnings by the Indians who are believed to have created the prairies which the first white settlers found. The white man has added land clearing, logging and large forest fires to the forces which have changed the primitive coniferous forest. Prior to 1850 a dense forest of Douglas fir intermixed with western hemlock, western red cedar and white fir covered all of the hilly and mountainous land. Bottom land hardwood forests of alder, broad-leaved maple, cottonwood, willow, Oregon ash and cascara impeded the early traveler and land settler. As late as 1953, the U. S. Forest Service classified 88 percent or 1,372,910 acres of the Lewis County area as forested land. <sup>1/</sup>

Logging and lumbering have been major activities since 1860. Forest cutting progressed from the Willapa Hills eastward and by 1955 logging was taking place in high Cascade Mountain forests. The Willapa Hills were mainly logged over by 1940 and today a thick cover of second growth Douglas fir covers the area. Large areas of the Cascade foothills are younger regrowth forests of Douglas fir or alder. However, large primitive forests remain in Snoqualmie National Forest, Gifford Pinchot National Forest and Mount Rainier National Park. These Federal lands comprise about 307,000 acres in Lewis County. In 1953, the principal forest types and the acreage covered were Douglas fir 892,470 acres, western hemlock 111,060, western red cedar 7,120, Alpine firs and hemlock 72,040, and hardwoods 65,010.

According to the U. S. Forest Service there was a net live sawtimber volume of 29,890 million board feet in Lewis County in 1953. This resource supports an active logging and lumbering industry located mainly in the eastern half of the county. Part-time farmers are employed in this industry and some also serve with the U. S. Forest Service on a seasonal basis. A large volume of sawlogs are taken out by rail and trucked to tidewater mills on Puget Sound and the Columbia River. The U. S. Forest Service sells at public auction mature timber in Gifford

<sup>1/</sup> U. S. Forest Service, Pacific Northwest and Range Experiment Station, Portland, Oregon. Forest Statistics for Lewis County, Washington, 1953.

Pinchot and Snoqualmie National Forests. Twenty-five percent of the revenues from these sales within the boundaries of Lewis County are returned to the county for schools and roads. In 1949 there were 62 mills in Lewis County which produced 194,751,000 board feet of lumber. This was a decline from 1927 when 28 large mills cut 434,993,000 board feet <sup>1</sup>/<sub>.</sub> In 1962, however, Lewis County was Washington's top timber producing county by cutting 545,180,000 board feet or about 11 percent of the total state timber harvest.

A sizable amount of forest products is sold from woodlands owned by farmers. In Lewis County, there were 1,628 farms with over 124,000 acres of woodland in 1959. In the same year, 617 farms reported forest products cut and/or sold.

The forest land also contains a rich resource of wildlife. The mountains and lowlands of Lewis County hold large populations of elk and deer. The county is blessed with abundant lakes and streams, which provide excellent trout fishing. Trappers, many of whom are farm boys, generally make an important fur catch each winter. In the 1962-1963 season, 584 muskrat, 88 mink, 78 raccoon, 37 otter, 13 skunk, 10 civet cat, 7 bobcat, 6 marten, 9 red fox and 5 weasel were caught by 20 trappers <sup>2</sup>/<sub>.</sub>

#### Land Classification and Soils

Because of its mountainous and hilly topography, Lewis County is divided into seven broad classes of land use capability. The terrain and varied processes of soil formation over many centuries have created a large variety of soil types. Many farms in the hilly areas have two or more classes of land and include several soil types.

Class I and II lands, the best farming areas of the county, are limited for the most part to the Upper Chehalis River bottom lands west and south of Chehalis and the Klickitat Prairie section at Mossyrock. The terrain is level and slightly rolling. Soils are fine textured, fairly well drained, deep and hold moisture well. Bottom lands and terraces have the best soils of the county. They include the Chehalis soil series of two types: silty clay loam and silt loam deposited by the Chehalis River. Mossyrock silt loam covers about 1,500 acres on the prairie at Mossyrock. It was formed under grass on an old terrace of the Cowlitz River. Both the Chehalis and Mossyrock soils are good and their only deficiency is low calcium or lime content. Drainage of winter run-off and topsoil dryness in summer are localized problems.

Class III and IV lands cover about one-fourth of the county and support most Lewis County farms. It includes upland terraces, numerous foothill valleys and major bottomlands along the upper Chehalis, Cowlitz and Nisqually Valleys. Much of this land is covered with forest or stumps, or is poorly drained, and in other places it is hilly. Soil is acid or lime deficient and varies in texture. Soils in the III and IV lands include the Winlock, Melbourne and Salkum loams surrounding Winlock and Toledo, the Spanaway gravelly, sandy loams around Centralia, the Siler silt loams in the Cowlitz Valley around Randle, Riffe peat and Riffe loams

<sup>1</sup>/ West Coast Lumbermen's Association, Portland, Oregon. 1949-1950 Statistical Year Book, Douglas Fir Region, 1951.

<sup>2</sup>/ Washington State Game Department, Olympia, Washington. Report of Trappers' Catch, 1962-1963.

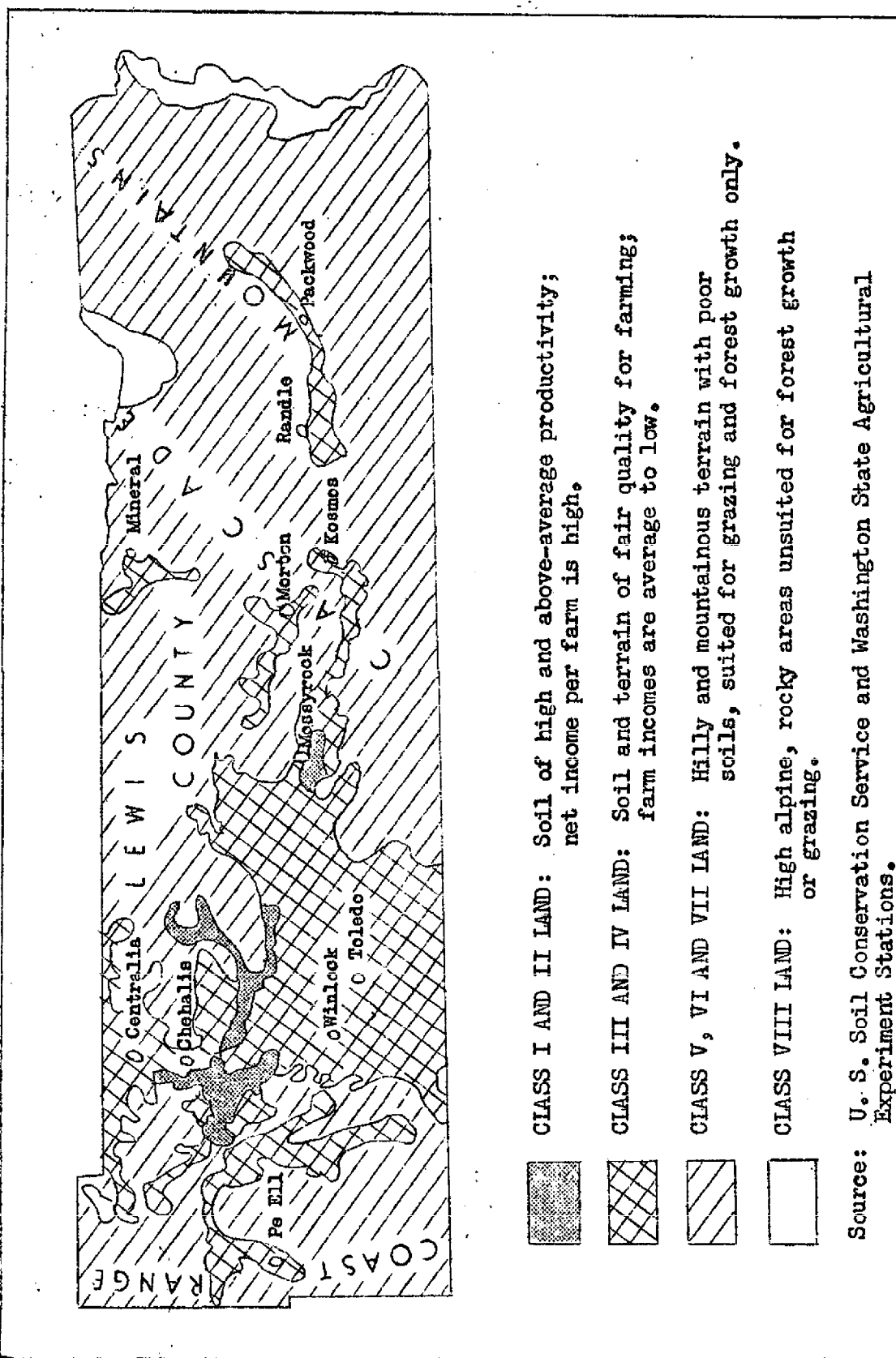


Figure 5. General Quality of Land in Lewis County

at Morton, and the Olequa and Grande Ronde silt loams in the Coast Range valleys between Chehalis and Pe Ell. Glacial and stream deposited soils, peat bog soils, and pumice and volcanic ash from Mt. St. Helens are intermixed, making a complicated soils map.

Classes V, VI and VII lands make up well over half the county area. These classes are hilly and mountainous and are logged-over or are in forest. Several hundred, small part-time farms are located on these lands along narrow creek valleys. Most of these classes are within Snoqualmie and Gifford Pinchot National Forests. Soils of these mountainous uplands include the Olympic, Vader and Melbourne gravelly loams. On the terraces and creek bottoms which are farmed are the Winston, Cispus, Nisqually and Greenwater silty and sandy loams.

### Climate

The relation of climate and weather to agriculture is very important as it is almost the ultimate determinant of what shall be grown. Lewis County has a mid-latitude, west coast type climate, which is influenced by the mild, moist air flowing in from the ocean. The county is located in the West Coast Marine Climatic Region of North America. This climatic belt extends along the coast from southeastern Alaska to northern California. Prevailing westerly winds of ocean air rising over the Willapa Hills and Cascade Mountains bring cool, cloudy and wet conditions for about nine months of the year. During the summer, the land is warm and the oceanic winds are heated so they do not bring moisture as frequently as in winter. Thus, there is generally a dry period during July and August with ample sunshine to mature crops and provide good harvesting conditions for hay and grain. Because of changes in elevation from the low bottomlands of the Chehalis and Cowlitz Rivers to the Cascade foothills and mountains, temperatures, precipitation and frost conditions vary considerably.

Throughout the lowlands, the average maximum temperature during the warmest months ranges from 68 to 79 degrees and the nighttime temperatures from 56 to 65 degrees. Heat extremes to 108 degrees and below freezing temperatures have been recorded and occasionally crops are damaged. Temperatures in the highlands are 5 to 15 degrees cooler and decrease considerably from west to east with increase in elevation along the Cascade slope.

Winters are cold with freezing temperatures and snowfall occurs in both the high and low elevations. The average maximum temperature for the valley lowlands in the coldest month ranges from 10 to 13 degrees above freezing. Average minimum temperatures range from 35 to 39 degrees. During a few cold winters, temperatures have dropped to a -9 degrees or lower. Winter extremes of 2 to a -11 degrees have been recorded in the lowlands from Centralia to Kosmos.

The growing season varies greatly in the county. Centralia has a growing season of 178 days as an average, while Kosmos in the Cascade foothills has an average period of 142 days free of killing frost between spring and autumn. In the upper Cowlitz Valley, killing frosts can occur as late as June and as early as September. The risk of freezing temperatures at given locations in Lewis County is given in Table .

The precipitation pattern varies considerably with changes in altitude from the Cascade Range to the Cowlitz Prairies. The Cascade highland section in the eastern part of the county is moist, receiving about 80 inches annually at Longmire

Table 4. Temperature Data  
Average Maximum, Average Minimum, Mean, Highest and Lowest Temperature Each Month  
Lewis County

Station	Data	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Annual
Centralia (185' elev.) 1931-1960	Av. Max.	45.8	50.1	55.2	62.8	69.5	73.1	79.1	78.4	73.6	63.1	52.4	47.6	62.6
	Av. Min.	32.6	34.0	35.5	39.1	43.5	47.8	51.0	50.3	47.5	42.9	37.2	35.6	41.4
	Mean	39.2	42.1	45.4	51.0	56.5	60.5	65.1	64.4	60.6	53.0	44.5	41.6	52.0
	Highest	68	75	82	91	97	100	104	101	100	90	75	68	104
	Lowest	2	2	16	24	27	31	37	37	30	23	5	5	2
Kosmos (775' elev.) 1933-1960	Av. Max.	42.9	47.4	52.6	60.6	67.4	71.5	79.2	77.6	73.3	62.5	51.4	45.7	61.0
	Av. Min.	28.6	30.8	32.8	36.5	41.4	46.1	48.8	47.3	44.1	39.3	33.4	32.2	38.4
	Mean	35.2	39.1	42.7	48.6	54.4	58.8	64.0	62.5	58.7	50.9	42.4	39.0	49.7
	Highest	72	74	82	92	95	103	105	105	102	95	83	63	105
	Lowest	-11	-12	9	20	23	29	33	33	27	17	1	10	-12
Longmire R. S. (2762' elev.) 1931-1960	Av. Max.	36.2	39.6	44.0	52.5	61.6	66.2	74.9	73.6	68.5	57.4	44.6	38.7	54.8
	Av. Min.	24.3	26.0	27.6	31.6	37.3	42.9	47.4	46.9	43.5	37.7	30.8	28.1	35.3
	Mean	30.3	32.8	35.8	42.1	49.5	54.6	61.2	60.3	56.0	47.6	37.8	33.4	45.1
	Highest	60	64	73	83	95	95	105	100	97	88	72	60	105
	Lowest	-9	-8	-1	12	21	28	35	33	28	17	-3	-1	-9

Source: U. S. Weather Bureau, Climatological Office.

Table 5. Probability of Freezing Temperatures -- Lewis County <sup>1/</sup>

STATION	TEMP. (° F.)	PROBABILITY -- SPRING					PROBABILITY -- FALL					Grow- ing Season Mean Length (Days)
		90%	75%	50%	25%	10%	10%	25%	50%	75%	90%	
Centralia	32	Mar 30	Apr 11	Apr 24	May 7	May 19	Sep 26	Oct 7	Oct 19	Nov 1	Nov 13	178
	28	Feb 27	Mar 11	Mar 24	Apr 7	Apr 18	Oct 19	Oct 30	Nov 12	Nov 25	Dec 12	233
	24	—	Jan 30	Feb 17	Mar 4	Mar 16	Nov 12	Nov 24	Dec 8	Dec 30	—	294
Kosmos	32	Apr 18	Apr 30	May 13	May 26	Jun 7	Sep 8	Sep 19	Oct 2	Oct 14	Oct 25	142
	28	Mar 16	Mar 28	Apr 11	Apr 25	May 6	Oct 7	Oct 17	Oct 30	Nov 11	Nov 21	202
	24	Feb 10	Feb 25	Mar 12	Mar 24	Apr 4	Oct 23	Nov 1	Nov 16	Dec 1	—	249
Rainier Longmire	32	Apr 30	May 12	May 25	Jun 8	Jun 19	Sep 8	Sep 19	Oct 1	Oct 14	Oct 24	129
	28	Apr 4	Apr 17	Apr 30	May 13	May 25	Oct 6	Oct 17	Oct 29	Nov 10	Nov 20	182
	24	Mar 11	Mar 23	Apr 5	Apr 18	Apr 30	Oct 25	Nov 5	Nov 17	Nov 29	Dec 10	226

Source: U. S. Weather Bureau, Climatological Office.

<sup>1/</sup> To illustrate the data in the table, we find that the 50 percent probability of a 32° spring freeze for Centralia is April 24. But there is also a 25 percent chance (1 year in 4) that a 32° freeze will occur as late as May 7, and 10 percent chance as late as May 19.

Table 6. Precipitation - Lewis County  
(inches)

Station	Elevation (ft.)	Period of Record	Average Annual	Greatest Annual	Least Annual	Greatest Monthly	Least Monthly	Greatest Daily
Centralia	185	1931-60	45.53	59.29	28.82	22.12	T	3.97
Kosmos	775	1933-60	62.01	83.17	34.89	28.45	0	4.02
Longmire	2,762	1931-60	82.43	113.60	25.65	36.09	0	6.11
Packwood	1,060	1925-60	53.55	78.50	34.21	33.66	0	4.75

Source: U. S. Weather Bureau, Climatological Office.

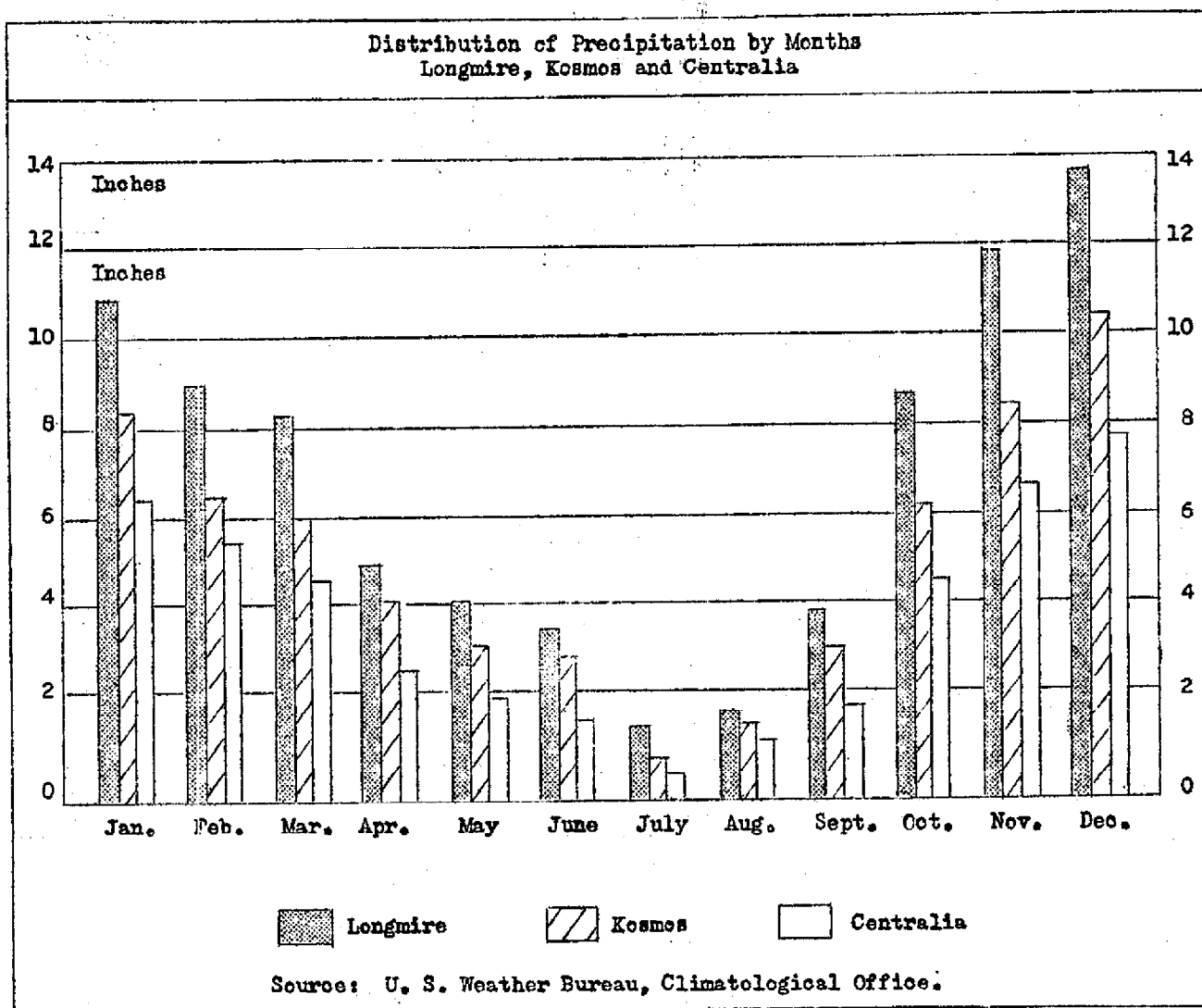


Figure 6. A graph of the rainfall at Longmire, Kosmos and Centralia shows a summer dry season during June, July, August and September. The wet season extends from October to the end of May.

to 62 inches at Kosmos in the lower western slope foothills. Heavy rain and snow in the mountains is essential as the source of irrigation water. The driest area includes the prairies extending from Toledo to Centralia where the average annual precipitation is estimated at about 45 inches. The Coast Range or Willapa Hills to the westward are much wetter, ranging from 50 to over 70 inches.

Based on 30 years of record at Centralia, Kosmos and Longmire, there is a wet season extending from the beginning of October to the end of May. During the rainy season, rainfall is usually light to moderate over a period of time, rather than coming as heavy downpours for brief periods. However, occasional rainfall of heavy intensity can be expected. In the lower valleys, snowfall is light, seldom on the ground longer than one or two weeks and seldom exceeding 6-12 inches in depth. Snowfall increases in the mountains with the snow line in mid-winter extending down to about 1,500 feet above sea level. During the spring months, rainfall decreases and the dense snow pack melts rather slowly, thus flooding in the lower valleys is less frequent.

The winter, wet period is followed by a summer dry season during June through September. In July and August, it is not unusual for two or three weeks to pass without measurable rainfall. The dry season is often critical in August for pastures and growing crops often require sprinkler irrigation. It also creates a fire hazard in the forested upland country and generally each summer the forestry services of the Federal and State governments must close large areas to campers and fishermen. Each summer a number of forest fires are started by lightning during thunderstorms. These thunderstorms occur on one to three days each month from March through October. Average number of thunderstorms each year ranges from approximately 5 in the lower elevations to 15 in the mountains. Hail of sufficient size or intensity to result in crop damage is unusual.

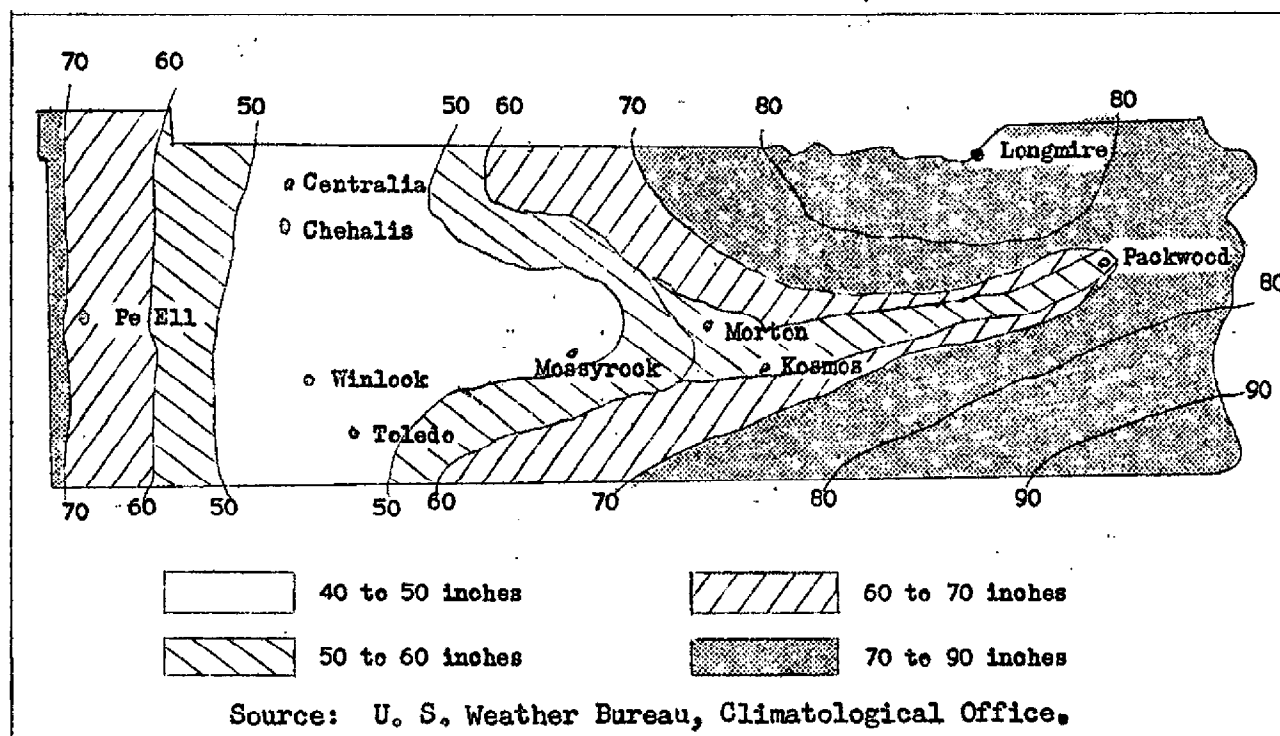


Figure 7. Distribution of Precipitation  
Lewis County

Table 7. Lewis County's Rank Compared With  
Other Washington Counties, 1959

Item Compared	Rank	Quantity
<u>General</u>		
Land area .....	6	1,566,080 acres
Number of farms .....	8	2,230 farms
Land in farms-percent .....	23	16.3 percent
Average size of farms .....	24	114.4 acres
Cropland harvested .....	19	57,492 acres
Irrigated land in farms .....	22	5,244 acres
Rural farm population .....	8	6,303 persons <sup>1/</sup>
Total county population .....	16	41,858 persons <sup>1/</sup>
<u>Cash farm income</u>		
Value of all farm products sold.	21	9,829,217 dollars
Value of livestock sold .....	11	7,935,581 dollars
Value of crops sold .....	26	1,893,636 dollars
<u>Livestock on farms</u>		
All cattle and calves .....	13	37,600 head
Milk cows .....	9	9,470 head
Hogs .....	15	3,166 head
Chickens .....	4	489,782 birds
Horses and mules .....	18	936 head
Sheep and lambs .....	17	3,489 head
<u>Dairy and poultry products sold</u>		
Value of dairy products sold ...	11	2,344,317 dollars
Whole milk sold .....	10	61,148,465 pounds
Value of poultry products sold .	4	3,152,585 dollars
Chickens sold .....	4	1,380,185 birds
Eggs sold .....	4	6,108,363 dozen
<u>Important crops harvested</u>		
Red clover seed .....	1	726 acres
Clover-timothy hay .....	2	25,056 acres
Filberts and hazelnuts .....	2	12,314 acres
Oats .....	4	11,028 acres
Strawberries .....	5	658 acres
Grass silage .....	7	4,199 acres

<sup>1/</sup> U. S. Census of Population, 1960.

Source: U. S. Census of Agriculture, 1959.